3. (Amended) The method of claim 1 wherein the step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a stimulus selected from the group consisting of exposure to a reducing agent, oxidizer, chelating agent, radical initiator, carbonic acid, ozone, chlorine, bromine, peroxide, electric current, ultrasound, change in pH, change in salinity, change in ion concentration, and change in pressure other than mechanically crushing by closing fractures.

4. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in pH environment.

5. (Amended) The method of claim 4 wherein said step of exposing the inactivated substrate-degrading agent to a change in pH comprises lowering the pH environment.

6. (Amended) The method of claim 5 wherein said step of lowering the pH environment comprises exposing the inactivated substrate-degrading agent to carbonic acid.

7. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in salinity.

8. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a reducing agent.

9. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to an oxidizer.

10. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a chelating agent.

11. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a radical initiator.

12. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to ozone.

13. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to chlorine or bromine.

14. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to peroxide.

15. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to an electric current.

16. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to ultrasound.

17. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in ion concentration.

19. (Amended) The method of claim 1 wherein said step of applying a triggering signal comprises exposing the inactivated substrate-degrading agent to a change in pressure other than mechanically crushing by closing fractures.

20. (Amended) The method of claim 1 wherein said substrate-degrading agent comprises at least one agent chosen from enzymes, microorganisms, spores and inorganic chemicals.

21. (Amended) The method of claim 20 wherein said sequestration comprises encapsulating said substrate-degrading agent with an encapsulating material that maintains the substrate-degrading agent substantially unreactive under normal conditions of use of said fluid or solid or mixture thereof, and is responsive to said triggering signal such that at least a portion of said substrate-degrading agent is released by said encapsulating material upon exposure to said triggering signal.

30. (Amended) The method of claim 21 wherein the fluid or solid comprises at least two inactivated substrate-degrading agents, wherein the inactivated substrate-degrading agents are capable of being reactivated by the same or different triggering signals, such that upon reactivation the reactivated substrate-degrading agents are capable of acting upon the same or different substrates independently or in concert.

31. (Amended) The method of claim 21 wherein said substrate-degrading agent comprises an endo-amylase.

32. (Amended) The method of claim 21 wherein said substrate-degrading agent is alpha-amylase.

33. (Amended) The method of claim 21 wherein said substrate-degrading agent comprises an enzyme selected from the group consisting of exo-amylases, isoamylases, glucosidases, amylo-glucosidases, malto-hydrolases, maltosidases, isomalto-hydrolases and malto-hexaosidases.

34. (Amended) The method of claim 21 wherein the released substrate-degrading agent is capable of being activated by application of a second triggering signal, wherein the second triggering signal may be the same or a different triggering signal, such that the inactivated substrate-degrading agent no longer acts on the substrate.

35. (Amended) The method of claim 1 wherein the degradable substrate is selected from the group consisting of celluloses, derivatized celluloses, starches, derivatized starches, xanthans and derivatized xanthans.

36. (Amended) The method of claim 1 wherein the fluid is chosen from the group consisting of circulating drilling fluid, completion fluid, stimulation fluid, gravel packing fluid and workover fluid.

39. (Amended) The method of claim 1 wherein said solid comprises a device or particle suitable for use downhole or on the surface for hydrocarbon exploitation.

40. (Amended) A method of increasing the flow of hydrocarbons from a well, the method comprising:

providing a fluid comprising a degradable polymeric substrate and a substrate-degrading agent inactivated by sequestration, said inactivated substrate-degrading agent being substantially unreactive under the normal conditions of use of the fluid or solid or mixture thereof, and becoming active in responsive to a predetermined triggering signal not present under said normal conditions of use, and said inactivated substrate-degrading agent being responsive to a predetermined triggering signal;

introducing the fluid into a downhole environment; and,

applying a triggering signal other than a change in temperature or mechanically crushing by closing fractures on the fluid, the triggering signal being sufficient to reactivate the inactivated enzyme to give a reactivated enzyme,

the reactivated enzyme being capable of selectively degrading the substrate sufficient to alter a physical property of the fluid or a solid formed therefrom such that the flow of hydrocarbons from said well is increased.

41. (Amended) The method of claim 40 comprising:

carrying out drilling activity wherein said fluid comprises a circulating drilling fluid containing an enzyme-degradable substrate and an inactivated enzyme that is capable of withstanding the dynamic environmental conditions generating while drilling; and

forming a low-permeability filter cake or fluid invasion containing said degradable substrate and said inactivated enzyme, said low-permeability filter cake or fluid invasion retaining low-permeability until receipt of said triggering signal sufficient to reactivate at least a portion of said enzyme.

43. (Amended) The method of claim 40 wherein the fluid is chosen from the group consisting of a circulating drilling fluid, a completion fluid, a workover fluid, a fracturing fluid, a gravel packing fluid and a stimulation fluid.

44. (Amended) A method of degrading filter cake, the method comprising:

providing a fluid comprising a polymeric viscosifier or fluid loss control agent and an enzyme inactivated by sequestration, said inactivated enzyme being responsive to a predetermined triggering signal;

introducing the fluid into a downhole environment such that a filter cake containing said polymeric viscosifier or fluid loss control agent and said inactivated enzyme is formed;

applying a triggering signal other than a change in temperature or mechanically crushing by closing fractures to reactivate the inactivated enzyme to give a reactivated enzyme,

the reactivated enzyme being capable of selectively degrading said polymeric viscosifier or fluid loss control agent such that said filter cake containing said viscosifier or fluid loss control agent at least partially disintegrates.

46. (Amended) A method of degrading a contaminant arising from a subterranean formation comprising:

providing a fluid comprising a substrate-degrading agent inactivated by sequestration, said inactivated substrate-degrading agent being responsive to a predetermined triggering signal;

introducing the fluid into a downhole environment that may contain a predetermined contaminant that is a substrate capable of being degraded by said substrate-degrading agent under degradation promoting conditions; and

applying a triggering signal, other than a change in temperature or mechanically crushing by closing fractures on the fluid, either by direct action or by the action of the contaminant, the triggering signal being sufficient to reactivate the inactivated substrate-degrading agent to give a reactivated agent,

allowing the reactivated substrate-degrading agent to degrade the contaminant.

47. (Amended) The method of claim 46 wherein the fluid is a circulating drilling fluid, completion fluid, gravel packing fluid or workover fluid.

49. (Amended) A wellbore treatment method comprising:

providing a fluid or a solid containing a substrate-degrading agent inactivated by sequestration, said inactivated substrate-degrading agent being responsive to a predetermined triggering signal such that said substrate-degrading agent becomes activated upon exposure to said

triggering signal, the activated substrate-degrading agent being capable of degrading said substrate under degradation promoting conditions;

introducing said fluid or solid into a downhole environment containing a said substrate; and

providing said trigger signal, other than a change in temperature or mechanically crushing by closing fractures, to activate the substrate-degrading agent; and

allowing the substrate-degrading agent to degrade the substrate.

Please add the following new claims 86-103:

86. (New) The method of claim 1 wherein said degradation promoting conditions comprise said normal conditions of use of said fluid or solid or mixture thereof.

87. (New) The method of claim 1 wherein said degradation promoting conditions comprise an alteration of said normal conditions of use of said fluid or solid or mixture thereof, resulting from said applying said triggering signal.

88. (New) The method of claim 1 wherein said fluid or solid contains said degradable substrate.

89. (New) The method of claim 88 wherein said solid comprises a filter cake or a bridging particle.

90. (New) The method of claim 88 comprising allowing said substrate to degrade whereby a physical property of said fluid or solid is altered, said triggering signal being incapable of effecting said alteration if applied in the absence of said inactivated substrate-degrading agent.

91. (New) The method of claim 5 wherein said step of lowering the pH environment comprises reducing the pressure within an excavation so that naturally-occurring carbonic acid, hydrosulfuric acid, or other naturally occurring acid or precursors thereof, previously excluded from said excavation by application of higher pressure, enter into said excavation to lower the pH environment of the inactivated substrate-degrading agent .

92. (New) The method of claim 46 wherein said triggering signal comprises said contaminant.

93. (New) The method of claim 1 wherein said inactivated substrate-degrading agent is separate from said substrate and said method comprises:

supplying said triggering signal to said fluid or solid containing said inactivated substrate-degrading agent such that said substrate-degrading agent becomes activated; and

exposing said activated substrate-degrading agent to said substrate.

94. (New) The method of claim 1 wherein said inactivated substrate-degrading agent comprises particles up to about 74 microns in diameter.

95. (New) The method of claim 1 wherein said inactivated substrate-degrading agent is capable of withstanding shear forces generated during drilling.

96. (New) The method of claim 1 wherein said inactivated substrate-degrading agent is capable of withstanding dynamic exposure to drilling temperatures.

97. (New) The method of claim 96 wherein said inactivated substrate-degrading agent is capable of withstanding dynamic exposure to temperatures up to 200°F.

98. (New) The method of claim 1 wherein said substrate-degrading agent is chosen from enzymes, microorganisms, spores, oxidizers and acids.

99. (New) The method of claim 98 wherein said acid is derived from a neutral polymer.

100. (New) The method of claim 99 wherein said neutral polymer is polyhydroxyacetic acid.

101. (New) The method of claim 4 wherein said inactivated substrate-degrading agent comprises an encapsulating material that becomes permeable to said substrate-degrading agent after exposure to said pH change, and said method comprises applying said pH change whereby said substrate-degrading agent passes through said encapsulating material.

102. (New) A method of increasing the permeability of filter cake in a wellbore, the method comprising:

obtaining a polymeric viscosifier or fluid loss control agent and a breaking agent capable of degrading said polymeric viscosifier or fluid loss control agent;

encapsulating said breaking agent in an ionophoric encapsulating material to obtain an encapsulated breaking agent, said ionophoric encapsulating material being permeable to said breaking agent at a defined first pH and impermeable to said breaking agent at a defined second pH;

carrying out drilling activity whereby a filter cake is formed comprising said polymeric viscosifier or fluid loss control agent and said encapsulated breaking agent, said filter cake having a first permeability to a defined wellbore fluid;

changing the pH of the filter cake from said first pH to said second pH, whereby permeability of said encapsulating material to said breaking agent changes such that said breaking agent becomes unencapsulated;

allowing said unencapsulated breaking agent to degrade said polymeric viscosifer or fluid loss control agent such that the permeability of said filter cake changes from said first permeability to a second permeability that is greater than said first permeability.

103. (New) The method of claim 44 comprising removing said fluid from said downhole environment before applying said triggering signal.

REMARKS

In a Response to Restriction Requirement mailed to the Office on Monday, July 22, 2002, an election of Group I claims (claims 1-49) was made and the claims of Group II (claims 50-85) were canceled, as drawn to a non-elected invention. Applicants respectfully request entry of this Preliminary Amendment before the elected claims are considered on the merits.

Status of Claims

Claims 18, 28, 29 and 38 have been canceled.

New claims 86-103 have been added. Each of the new claims is properly included with the claims of Group I.